Survey of the

PREVALENCE OF COMMON PLANT DISEASES

in the

DOMINION OF CANADA

1921

Second Annual Report

Division of Botany
Experimental Farms Branch
Department of Agriculture.

Reports were made to the plant disease survey committee of the Canadian Phytopathological Society by the following:

Mr. I.L.Connors, Plant Pathologist, Dominion Laboratory of Plant Pathology, Brandon, general report for Manitoba.

Mr. J.W.Eastham, Provincial Plant Pathologist, Vancouver, general report for British Columbia.

Mr. Herbert Groh, Plant Disease Inspector, Division of Botany, (Ottawa), report on potato diseases for Manitoba.

Prof. J.E.Howitt, Ontario Agricultural College, Guelph, report on cereal diseases for Ontario.

Prof. W.T. MacClement, Queen's University, Kingston, report for Frontenac County.

Mr. J.B. MacCurry, Plant Pathologist, Dominion Laboratory of Plant Pathology, Charlottetown, general report for Prince Edward Island and Nova Scotia.

Signed.

W.H.Rankin,

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Committee.

CEREAL DISEASES

WHEAT

Stem rust, caused by Puccinia graminis

ova Scotia-

Common but not serious. Average infection 4.6%.

rince Edward Island-

Very little damage was caused by stem rust on account of the dry weather conditions. In no instance was the wheat crop found to be severely attacked.

tario-

Oxford County; very prevalent.

Simcoe County; very little damage.

Norfolk County; prevalent but apparently causing little reduction.

Welland County; seventy-five percent of wheat affected, estimated reduction in yield about 2%.

Waterloo County; very severe, estimated reduction in yield 33%.

" Lennox and Addington County; prevalent, estimated reduction in yield about 1%.

Algoma District; considerable stem rust.

itoba-

Dr. Bisby observed pycnia on the barberry at the Manitoba Agricultural College, Winnipeg, on May 27 and open aecia on June 1. Wherever barberry

bushes were observed, they were found to be rusted, frequently quite severely, and the aecia were freely sporulating during the greater part of June. Near these barberry bushes at the College, Hordeum jubatum was found rusted by June 15; but, except for this local infection, stem rust was not observed in the Province until June 27 at Emerson. During the week, June 29 - July 5, a scattered infection was found at Cartwright, Deloraine, Souris, Brandon and Rapid City; but none was recorded at Minnedosa and Neepawa. On July 8, a slightly heavier infection was reported for Portage la Prairie; and on the 11th, rust was visible at Winnipeg. It was present at Dauphin about July 15 and at Swan River on July 31. From the observations made this year, there seems to be no evidence that the rust appears earlier in the Red River Valley and then spreads in a north-westerly direction. The appearance of stem rust in the western part of the Province was rather earlier than in the east. The loss from stem rust was very difficult to estimate on account of other agencies taking a toll - such as drought. Undoubtedly, late seedlings and wheat planted in districts where moisture was abundant suffered considerably. The yield in the northern part of the Province has been reported to be cut in half. The loss from stem rust, based on the Manitoba "Free Press" annual report from 74 localities,

would be 15% of the crop - approximately a loss of nearly seven million bushels.

Saskatchewan and Alberta.-

The first collection of stem rust in Saskatchewan was made at Grenfell in southern Saskatchewan on July 5. At this date a few pustules could be collected here and there over a wide area. A few days later collections were made at Melville and further north. The rust spread rapidly and became severe in southern and eastern Saskatchewan. It is difficult to estimate the losses due to rust, but in southern Saskatchewan the yield was much below expectation. As this reduction of yield was in the districts where rust was most prevalent, doubtless this reduction in yield was due in a large measure to rust. The leaf rust (Puccinia triticina) as noted later, appeared very early and was very severe. This rust was probably also partly responsible for the lessened yield. An unusual feature of the rust attack this season was the patchy nature of infection. Some localities or fields suffered severely and neighboring districts, or adjacent fields, suffered little. On the whole, it does not seem an over estimate to place the loss due to rust in south-eastern-Saskatchewan at 20%; in some districts it was

probably much greater. In northern Saskatchewan the hot dry weather in August checked the rust, so that little damage was done. Dr. Seager Wheeler's summary of the rust situation in the Rosthern district, is true for northern Saskatchewan according to the writer's observations. Writing of the rust he says:

> "There is no doubt it caused a slight shrinkage of the grain, though I am not sure but that this was due to the hot dry weather. The stem rust in its action was very erratic this season. Instead of spreading uniformly through the crops, it appeared in small patches of not more than a few feet square, while the surrounding crops were only slightly affected. The rust did not spread owing to the hot dry weather in August, as there was no rain or dew or fog for about three weeks."

Stem rust was rare at Scott in West Saskatchewan and the region, as the rainfall was less than in most of Saskatchewan. Only traces of stem rust were found at Vermilion on August 16, and none at Edmonton and Lacombe a few days later. Mr. Sanford reports stem rust in the Edmonton district as very rare and no damage. Damage due to rust was reported to Mr. Sanford from Lloydminister in Alberta, but he was not able to get time to investigate and verify the reports.

Leaf rust, caused by Puccinia triticina

Nova Scotia-

No appreciable damage caused. Leaf surface affected 6.1%.

Prince Edward Island-

Very prevalent - numerous fields in all parts of the province ranging from 60 - 90% infection. It would, however, be difficult to estimate the damage owing to drought.

Manitoba-

Leaf rust made its appearance about two weeks previous to that of stem rust. It occurred not only abundantly on the leaf; but also on the sheath. Considerable confusion of the stem and leaf rust may be made. Leaf rust, although extremely abundant as the season advanced, caused a loss estimated at two percent.

Saskatchewan and Alberta-

This rust was severe in Saskatchewan and extended in a mild form into Alberta. It was the most severe attack of leaf rust that has occurred in western Canada for a number of years at least.

Loose smut, caused by Ustilago tritici

Nova Scotia-

Common. One report 14%; average infection 5.2%.

Prince Edward Island-

General throughout the province. Loss about 2.5%.

Ontario-

Southern part of province; surveys showed an average of about 3%. Northern part of province; surveys showed an average of about 2%.

Manitoba-

Loose smut was present in all parts of the Province from a trace to two percent. Three reports of 5% and 6% were recorded.

Saskatchewan and Alberta-

Mr. DeLong reported about 1% in the Lacombe district. Mr. Sanford reported the amount varying from no infection to 5%, many fields almost free. In Saskatchewan, the average infection would be about 1%.

Bunt caused by Tilletia laevis and T.tritici

Prince Edward Island-

General, but not severe. Damage about 2%.

Manitoba-

This smut was not found; but no doubt, occurs to a limited extent. Much of the wheat planted is treated with formalin.

Saskatchewan and Alberta-

Very little of this smut observed or reported. Seed treatment of wheat is general in the better farming district. "Noticed in one field about 2%; in another 10% (Sanford)."

Scab, caused by Gibberella saubinetti.

Prince Edward Island-

This disease occurred only to a very slight extent, only a few specimens being collected. Weather conditions prevented its usually general appearance.

Manitoba-

Scab was found on the plots at the Manitoba Agricultural College, Winnipeg. Ruby wheat showed 10%; while other varieties showed smaller percentages. Corn stubble was examined for the perfect stage; but none was observed.

Saskatchewan and Alberta-

A few collections were made in southern Saskatchewan and at Saskatoon and Rosthern. It was, however, rare, only a few heads here and there could be found. Not reported from Alberta.

Minor diseases of wheat.

Ontario-

There was present in northern and southern Ontario considerable leaf stripe, due to Helminthosporium.

Manitoba-

Blight (Helminthosporium sativum).--H.sativum caused considerable leaf injury; eighty percent (80% of the nodes and many of the heads of the Durum wheat on the experimental plots were

attacked more or less severely. The nodes of some of the stems were attacked so early that the head did not fill. Traces of Helminthosporium were observed on wheat throughout the Province and showed signs of causing severe damage at one place visited.

White tip (physiological) --This was prevalent in the drought-affected areas of the Province.

Saskatchewan and Alberta-

Root Rots ---These were found in some districts in Saskatchewan, probably due to Helminthosporium. Also reported from Alberta by Sanford.

Glume spot due to Septoria. No collections were [illegible].

Basal Glume Rot, due to Bacterium atrofaciens.---- This disease was much more common in Saskatchewan than usual throughout the districts where the rainfall was above the average. In some plots it ran as high as 10%.

Powdery mildew due to Erysiphe graminis.....Collections on wheat were made at Edmonton, Alta. It did no serious damage.

Stripe rust, (Puccinia glumarum) --- No collections were made this season.

OATS.

Stem rust, caused by Puccinia graminis.

Nova Scotia-

General and occasionally severe. Several fields showed 25% infection. Average 8.1%.

Prince Edward Island-

This disease, although not general, was severe in a few instances.

Ontario-

Halton County; stem rust and leaf rust estimated together as causing 30% reduction in yield.
Welland County; estimated reduction in yield about 2%. Average percentage infection in the field 75% of the stools.
Waterloo County; very severe.
Algoma District; considerable stem rust.

Manitoba-

Stem rust appeared much earlier than in the season of 1920. Wild oats were found rusted on June 27, 1921, at Emerson, Man. A loss of 5% occurred this season.

Saskatchewan and Alberta-

Common over the same area as Wheat stem rust, in some places doing serious damage.

Leaf rust, caused by Puccinia coronata

Nova Scotia-

Very common and often severe. Twenty-nine reports averaged 18% of the leaf area affected.

Prince Edward Island-

General, especially in Queen's County, but not severe.

Ontario-

Bruce County; estimated reduction in yield 20%.
Leeds County; estimated reduction in yield 15%.

Lennox County; average reduction in yield about 5%, as high as 20% in some fields.

Prince Edward County; estimated reduction in yield 50%.

Lambton County; very prevalent.

Halton County; leaf and stem rust caused estimated reduction in yield of 30%.

Middlesex County; estimated reduction in yield 15%.

Kent County; very prevalent.

Grenville County; 5% of crop affected, damage not serious.

Wellington County; 60% affected, reduction in yield about 5%.

Simcoe County; very severe, estimated reduction in yield about 50%. Late oats practically total loss.

Lincoln County; estimated reduction in yield from 5 to 10%.

Oxford County; prevalent.

Huron County; very severe, estimated reduction in yield 25 to 50%.

Algoma District; very light attack.

Kenora District; reduction in yield about 15 to 20%.

Rainy River; reduction in yield about 20%.

Manitoba-

Leaf rust appeared about the same time as the stem rust. It was fairly prevalent over the Province, but caused very slight loss.

Saskatchewan and Alberta-

Present in Saskatchewan, but not severe.

Smut, caused by Ustilago levis and U. avenae.

Nova Scotia-

This disease was very prevalent ranging from .5 to 20% infection. Thirty-seven reports averaged 5.3%.

Prince Edward Island-

Common, causing considerable damage. Infection from 1 to 23%.

Ontario-

Oat smut was as usual the most important of the cereal smuts. Actual counts made in Wellington County and believed to be typical for the Province.

Variety	%Smut
White cluster	0.0
Banner	0.03
Banner	trace
O.A.C. No. 72	trace
Banner	18.0
Mammoth cluster	trace
Banner	19.8

In Frontenac County the losses ranged from 5% to 15%. An average of 5% oat smut loss is estimated for the Province. The following counts were made in northern Ontario.

Locality	%Smut
Emo	8.0
Kenora	5.0
Kenora	4.5
Kenora	3.5
Rainy River	6.0
Eagle River	20.0
Port Arthur	2.0
Murillo	2.0
Fort William	6.0
Fort William	10.0
Fort William	1.0

Manitoba-

Traces of smut were observed in the Province generally; but in only a few cases could the loss be estimated. The oat smuts are easily controlled; but the growers do not treat their grain every season, which accounts for the appearance of these smuts.

Saskatchewan and Alberta-

DeLong reports only about 1 - 10% in the Lacombe district. General, but usually the percentage small, not averaging more than 2 to 3%.

Minor diseases of oats.

Manitoba-

Spikelet sterility occurred throughout the Province, especially in the dry parts. One field showed from 25 to 30% loss.

Saskatchewan and Alberta-

Root rot was severe on a small plot at Saskatoon, about 50% due to a Fusarium. Reported from the Edmonton district by Sanford.

BARLEY

Stem rust, caused by Puccinia graminis

Prince Edward Island-

This disease was common wherever the host was grown, but caused little damage.

Ontario-

Huron County; prevalent.

Simcoe County; very little damage.

Norfolk County; prevalent, but apparently causing little reduction in yield.

Welland County; seventy-five percent infection, estimated reduction in yield about 2%.

Halton County; reduction in yield of 15% or more.

Waterloo County; very severe, estimated reduction in yield about 33%.

Lennox and Addington Counties; prevalent, causing about 1% reduction in yield.

Manitoba-

Barley was as heavily rusted with stem rust as usual; but 5% reduction of yield would cover the loss.

Saskatchewan and Alberta-

Common over the same area as Wheat stem rust, but apparently doing little damage.

Loose smut, caused by Ustilago nuda.

Prince Edward Island-

General throughout the province, infection varying from .5% to 10%.

Ontario-

Loose smut of barley was present to the average extent of about 4% in southern Ontario and about 2% in northern Ontario.

Manitoba-

Loose smut was observed less frequently than in the previous year. In a large number of fields observed it was absent or only a trace present. One instance of 5% was noted.

Saskatchewan and Alberta-

General, In a few fields very severe, in some as high as 30%.

Covered smut, caused by Ustilago Hordei.

Prince Edward Island-

Not observed.

Ontario-

Reported from Frontenac County as more prevalent than usual but not causing more than 5% loss.

Saskatchewan and Alberta-

General, but usually only a small percentage. In some fields 10%.

Stripe disease, caused by Helminthosporium gramineum

Nova Scotia-

Very prevalent practically throughout the Province. Usually about 30 - 50% of leaves affected.

Manitoba-

Stripe was not serious in Manitoba this year.

Saskatchewan and Alberta-

This disease was rather common in northern Alberta, but usually percentage was not high. Present, but not severe in Saskatchewan.

-Spot blotch caused by Helminthosporium sativum-

Manitoba-

Spot blotch averaged seven and one-half percent in the twenty fields in the area mentioned under net blotch; one field gave 40% infection.

Saskatchewan and Alberta-

Common in Saskatchewan and in northern Ontario, in some places severe and causing injury.

-Net blotch caused by Helminthosporium teres-

Manitoba-

An average of 10% infection was found in the fields surveyed in the country south of the C. P. R. line to Saskatoon, Sask. The maximum infection was 40%. At the Experimental Farm, Brandon, Man., barley varieties on the plots ran from 15% to 100% affected ---Manchurian and Stella were particularly susceptible.

-Ergot caused by Claviceps purpurea-

Manitoba-

A trace of ergot was observed on the barley at the Experimental Farm.

CORN

-Smut caused by Ustilago zeae-

Manitoba-

This smut was widely distributed; but generally it caused no more loss than last year.

-Rust caused by Puccinia sorghi-

Manitoba-

Rust made its first recorded appearance in Manitoba at the Agricultural College this year. It caused an infection as severe as the writer has ever seen.

RYE

-Stem rust caused by Puccinia graminis-

Manitoba-

Stem rust was present in very sparing quantity on spring rye.

It develops only late in the season.

-Leaf rust caused by Puccinia dispersa-

Manitoba-

Leaf rust was very common; but it causes little damage.

Saskatchewan and Alberta-

"Slight to severe in a number of fields in Edmonton district; no serious damage." (Sanford).

-Flag smut caused by Urocystis occulata-

Manitoba-

This smut was absent this year, as last.

Saskatchewan and Alberta-

About half-a-dozen heads were collected in southern Alberta.

There were no other reports of this disease.

Ergot, caused by Claviceps purpurea

Manitoba-

Ergot occurred commonly in rye; but the percentage of loss is small.

Saskatchewan and Alberta-

Generally distributed, but not common enough to cause serious injury. "General about Edmonton, but probably less than 1% (Sanford)."

FORAGE CROP DISEASES

ALFALFA

Leaf spot, caused by Pseudopeziza medicanginis

Prince Edward Island-

Infection was general, but little apparent damage resulted.

Manitoba-

This disease was quite common; but no great amount of damage was caused.

British Columbia-

Fairly general, but can hardly be described as serious.

Downy mildew, caused by Peronospora trifoliorum

Manitoba-

This disease was found at Brandon. It caused only a slight amount of yellowing of the leaves.

Root rot, caused by Sclerotinia trifoliorum

British Columbia-

This disease was found to be doing severe injury to alfalfa and red clover on a limited area at Duck Lake and Creston in East Kootenay.

AWNLESS BROME GRASS

Leaf spot, caused by Septoria sp.

Manitoba-

A septoria leaf spot on brome was found widespread.

Only occasionally can the fruiting stage be found; but heavy spotting of brome grass leaves appears to be due to this organism.

CLOVER

Rust, caused by Uromyces trifolii

Manitoba-

Uromyces trifolii occurred commonly on White Clover, killing some if the leaves.

SUNFLOWER

Rust, caused by Puccinia Helianthi

Manitoba-

Rust was more serious than last year; the leaves were heavily attacked with uredinial and telial stages and the lower leaves were killed.

Saskatchewan and Alberta-

General on sunflowers in Saskatchewan, but not doing very serious damage.

Wilt, stem rot or root rot, caused by Sclerotinia sp.

Manitoba-

A field at the Manitoba Agricultural College, planted to sunflowers last year was planted again. The sunflowers were attacked by wilt and stem rot in the same localized areas as were attacked last year. It evidently lives over in the soil by means of the sclerotia. Iva zanthifolia was attacked sparingly when in close association with the sunflowers.

Saskatchewan and Alberta-

A few infected plants were found at Edmonton, but the fungus seems distinct from the common Sclerotinia attacking sunflowers. Not collected elsewhere, this season.

Powdery mildew, caused by Erysiphe cichoracearum

Manitoba-

Powdery mildew made its appearance in the latter part of August, but it was very local.

TIMOTHY

Rust, caused by Puccinia graminis Phlei-pratense

Saskatchewan and Alberta-

Collected on timothy late in season in the Edmonton district. Not as common as usual.

WESTERN RYE GRASS.

Smut, caused by Ustilago Agropyri.

Saskatchewan and Alberta-

Not collected this year except on experimental plots.

FRUIT DISEASES

APPLE

Scab, caused by Venturia inaequalis

Nova Scotia-

Owing to the unusually dry spring and summer, scab was found to be much less severe than usual In unsprayed orchards, however, leaf and fruit infection averaged 13.5% and 38.7% respectively.

Prince Edward Island-

Scab was of comparatively little economic importance this year. Unsprayed trees showed from .5 to 7.5% infection. Sprayed trees examined were almost entirely free.

Ontario-

Scab was severe in southern Ontario. The following results of comparative dusting and spraying at Newcastle show the high percentages of scab and the ineffectiveness of the two dusts used. These tests were conducted by Mr. W.A.Ross, Dominion Entomological Branch.

Variety	Material	Scab %
McIntosh	Copper Arsenic Dust	92.92%
McIntosh	Sulphur Leaf Dust	76.46%
McIntosh	X Liquid Spray	7.05%
Stark	Copper Arsenic Dust	82.93%
Stark	Sulphur Lead Dust	74.12%
Stark	Lime Sulphur	2.91%
Spy	Copper Arsenic Dust	11.37%
Spy	Sulphur Lead Dust	13.26%
Spy	X Liquid Spray	3.09%

X First two sprays, Bordeaux mixture, third or post-blossom lime sulphur.

In Frontenac County and vicinity scab was prevalent on the more susceptible varieties. Loss where not sprayed was from 10% to 50%.

Manitoba-

Scab, Venturia inaequalis. A considerable amount of scab occurred on the leaves and fruit of the crab apple.

British Columbia-

Taking the Province as a whole there was a little less than the usual amount of this disease. Owing to spraying for the disease being practically universal in the fruit growing districts it is difficult to estimate the natural prevalence of the disease. In the Kootenay Lake district McIntosh Red sprayed only in the "pink" showed 5% of the fruit infected. Some trees of this susceptible variety showed as high as 25% infection where three sprayings had been given.

Twig blight, caused by Bacillus amylovorus.

Nova Scotia-

Very little of this disease was reported this year.

Prince Edward Island-

Present to a slight extent in a few orchards.

Ontario-

Considerable amount throughout the Niagara fruit district, where pears are planted abundantly. In some cases it was so severe as to cause damage to the trees, although on the whole it was not destructive. More common and severe than in 1920.

Manitoba-

This disease was sent in from Winnipeg and Carman, Man., in July. The damage seemed to be severe and it may have been here for some time.

Anthracnose, caused by Neofabraea malicorticis

British Columbia-

It was anticipated that this disease would be much more severe in its effects than usual during 1921, owing to the early and exceedingly heavy and continuous rains in the fall of 1920. Infection takes place with these fall rains and it was feared that many growers would be caught unprepared. However, in the coastal region, where the disease is chiefly found, it does not seem to have been materially worse. It is on the increase and will necessitate spraying at Salmon Arm in the Interior where it has hitherto been considered negligible. It is of much interest to find that Duchess trees at Vernon in the Dry Belt showed a serious development of cankers last year due to infection in the fall of 1920. This is the first case of the disease being of any importance in the irrigated country and is no doubt the direct consequence of the unusually heavy fall rains.

Mildew, caused by Podosphaera leucotricha.

British Columbia-

Until about three years ago this disease was not considered of any consequence and it is still of

little importance where climatic conditions render regular spraying for scab a necessity. In the "dry belt" however where scab is almost or quite absent the disease is on the increase and is creating considerable alarm. So far there has been comparatively little direct injury to the fruit but the stunting of the growth, while difficult to estimate, is often very marked.

Black rot canker, caused by Physalospora cydoniae

va Scotia-

From reports and observations this disease appears to be prevalent throughout a wide area in the Annapolis Valley, causing considerable damage to leaves and twigs. Leaf infection varied from .005% slight to 55% severe, averaging 8.85%. Twig infection varied in severity from 3% to 25% averaging 13.1%.

European canker, caused by Nectria galligena.

va Scotia-

This disease was found to be very prevalent in the Annapolis Valley and other points, causing considerable twig injury.

CHERRY.

Brown rot caused by Sclerotinia cinerea,

va Scotia-

Reported severe in several localities, loss varying from 3 to 80%.

Ontario-

Severe on sweet cherries and important in localities on sour cherries in the Niagara fruit district. There was only about a 30% crop set on sour cherries because of late frost injury. Many trees of sweet cherries were not picked because of brown rot and sour cherries rotted badly in the baskets. The actual loss varied greatly, from none to 100% in different localities and orchards.

British Columbia-

There is no record, as yet, of this disease in the areas of commercial cherry cultivation, though it is common in the coastal area. The blossom blight of sour cherries associated with this disease and reported last year was again severe in the same area (Cormorant Bay, Victoria) and will necessitate experimental work for control.

Leaf spot or yellow leaf, caused by Coccomyces spp.

Nova Scotia-

This disease was more or less general. Leaf infection varied from .02 to 25%, averaging 3.8%. The resulting damage, however, would be difficult to estimate.

Ontario-

Severe on sweet cherries in some localities and some damage on sour cherries. Bordeaux mixture gives good control for this disease, and lime sulphur is not so effective.

Black knot, caused by Plowrightia morbosa.

Nova Scotia-

There was a noticeable amount of this disease but damage was slight.

CURRANT

Leaf spots, caused by Mycosphaerella Grossulariae and Pseudopeziza Ribis.

Nova Scotia-

Present, but of little importance.

Prince Edward Island-

General, but caused little damage.

Ontario-

Moderate infection, general in Niagara district. Drought conditions accentuated the damage.

Manitoba-

Leaf spots were present.

Saskatchewan and Alberta-

Severe at Scott, causing defoliation.

Rust, caused by Puccinia Grossulariae

Prince Edward Island-

Found only in one instance.

Saskatchewan and Alberta-

On fruit of black currant at Scott, rather severe.

Felt rust, caused by Cronartium ribicola.

Nova Scotia-

One severe case on cultivated black currant noted at Kentville. 100% of leaves were infected moderate to severe.

Ontario-

Common in many plantings but causing little damage.

British Columbia-

This disease was discovered in September in the telial stage on black currants at Vancouver, North Vancouver, Point Grey, Huntingdon, Chilliwack, Agassiz, Victoria, Nanaimo, Courtenay and Comox, all in the Coastal area. Such scouting as was possible at this season in the interior did not reveal the presence of the disease. Infection was almost confined to R. nigrum, other varieties only showing light infection when closely adjoining heavily infected nigrum. The original source of the disease has not yet been located. Some five year old Pinus strobus in the City nursery at Stanley Park have shown the disease but these were raised from seed in B.C. Another infection on P. cembra had also taken place subsequent to planting.

GOOSEBERRY

Leaf spot, caused by Mycosphaerella Grossulariae and Pseudopeziza Ribis.

Nova Scotia-

Present, but of little importance this year.

Prince Edward Island-

General, but caused little damage.

British Columbia-

Caused a certain amount of injury at the Coast especially around Mission and Hatzie.

American Powdery Mildew, caused by Sphaerotheca mors-uvae.

Nova Scotia-

Present to a considerable extent on English varieties. One report 25% infection.

Prince Edward Island-

Two cases of slight infection were found on gooseberries.

British Columbia-

Apparently rather generally distributed. Even at Summerland one of the drier parts of the irrigated area, English gooseberries have been taken out owing to trouble with mildew. It is interesting to note that there is a plantation of the variety "Industry" at Burnaby (Lower Mainland) in which mildew has never appeared although spraying has never been followed.

GRAPE.

Dead Arm, caused by Cryptosporella Viticola.

Ontario-

Common in small percentages up to 5% in many vineyards of the Niagara district. This is uncommon for the district and was hardly noticed previously.

PEACH

Leaf curl, caused by Exoascus deformans

Nova Scotia-

Comparatively little in evidence. One report of as high as 25% of leaves affected.

Ontario-

Very severe throughout the Niagara district. Many trees lost nearly all or half their foliage. The infection period came very early after a warm period the first part of March. The large majority of growers failed to spray early enough. Those who did satisfactorily controlled it. Fall spraying is not practised in the district. Peaches set less than half a crop due to late frost injury. The trees recovered well from the curl and passed through the drought and hot weather successfully although on many days the leaves, many, almost limp. The fruit which was set, reached excellent size and was of good quality.

British Columbia-

Not severe in the commercial orchards, which are confined to the southern Okanagan (Dry Belt). Quite severe elsewhere.

Brown rot, caused by Sclerotinia cinerea.

Ontario-

Very little damage on fruit.

British Columbia-

Does not occur in the commercial peach area.

Scab, caused by Cladosporium carpophilum.

Ontario-

Abundant fruit infection on some varieties, reducing quality but not causing much money loss because of scarcity of the crop. No control measures are used for this disease in the Niagara district.

Powdery mildew, caused by Sphaerotheca pannosa

British Columbia-

Some years ago this was causing a good deal of loss, chiefly spoiling fruit for shipping purposes. Since the inauguration of compulsory spraying against the peach worm (usually strong lime sulphur when blossoms are showing pink) in the commercial peach area there has been a noticeable decrease in this disease.

PEAR.

Twig blight, caused by Bacillus amylovorus;

Nova Scotia-

This disease was found in a few orchards averaging .7% twig infection.

Ontario-

Very common and severe in the Niagara district.

British Columbia-

In most areas this disease is now fairly well under control but there has been some severe injury to pears in the southern Okanagan and a severe outbreak on both apples and pears at Kelowna. A little blight has occurred on the

Kootenay Lake one or twice during the last seven or eight years but was apparently eradicated. This year it appeared in a more severe form at a number of points in and around the city of Nelson, and one block of 50 pear trees will probably have to be taken out. This year also a severe case of blight was found in an orchard at Cranbrook, in the Crow's Nest Valley. Both apples and pears were severely affected, some trees being beyond saving. This is much further east than any previously recorded infection and it is of great practical importance since the important apple section of Creston and district lies between Nelson and Cranbrook, Blight has never been recorded in this district as yet but it is now exposed to infection from both East and West. The first epidemic of the disease at Salmon Arm occurred this season, a number of trees of the more susceptible varieties being destroyed. A little blight has been found here for the past few years and the present severity is in part at least, due to ignorant handling of the disease, especially as regards disinfection and sucker infection.

Scab, caused by Venturia Pyrina.

lova Scotia-

This disease was occasionally severe on the leaves, but comparatively little fruit injury was reported.

Ontario-

Common and severe in many localities.

British Columbia-

There was less of this disease than usual.

Leaf spot, caused by Mycosphaerella sentina

Nova Scotia-

Very little in evidence. Occurrences averaged 9% leaf infection.

PLUM.

Brown rot, caused by Sclerotinia cinerea.

Nova Scotia-

Occasionally severe. One report recorded 40%. Average, however, was low.

Ontario-

Not important.

Plum Pocket, caused by Exoascus Pruni.

Nova Scotia-

Although not generally distributed several severe infections were reported, 7 to 60%. Average loss about 6%.

Ontario-

Not common.

Manitoba-

This disease was very common at Winnipeg.

Saskatchewan and Alberta-

Plums at Rosthern were severely attacked by this disease.

Black knot, caused by Plowrightia morbosa

Nova Scotia-

Several severe cases were reported from the Annapolis Valley.

Prince Edward Island-

Several severe cases were observed in neglected trees. About 5% twigs affected.

Manitoba-

Black knot occurs sparingly on wild plums and cherries throughout the Province.

British Columbia-

A case of Plowrightia morbosa, the first I have seen in the Province, on cultivated plums or cherries was found this year near Vancouver. A form which appears morphologically identical is common on choke-cherries around Vernon but there is no record of its occurrence on cultivated varieties.

RASPBERRY.

Leaf curl, infectious but cause unknown.

Nova Scotia-

Present but not general. Four reports recording this disease averaged 5% of bushes affected usually severe in form, causing a loss to that extent.

Prince Edward Island-

This disease was found wherever Cuthbert raspberries were grown. Affected canes averaged 6%.

of the planting, the loss would be about the same figure. Herberts were entirely free. Occasional cases of leaf curl were found among wild raspberries.

tario- About the same loss in the Niagara district as in years previous. The following table shows the loss from leaf curl in the townships of Lincoln, Wentworth and Halton Counties which border on Lake Ontario. Missing bushes in variety Cuthbert are largely due to roguing for leaf curl and the percentages are shown together with the approximate total leaf curl loss for the past two or three years.

Average percent of leaf curl in Lincoln, Wentworth and Halton Counties.

	Cuthbert % Curl	% Missing	%Loss 2-3yrs.	Marlboro % Curl	Herbert %Curl
tham Tp.	3.5	1.4	4.9	-	0.0
n Tp.	2.1	4.4	6.5	0.0	-
ton Tp.	4.2	6.0	10.2	2.5	0.6
sby Tp.	6.1	7.6	13.7	-	1.5
Fleet Tp.	4.0	5.1	9.1	-	0.0
ington Distr.	2.9	8.0	10.9	0.5	0.0
ille Distr.	3.8	7.0	10.8	0.2	0.0
General average	3.8	5.6	9.4	0.8	0.3

Mosaic, infectious but cause unknown.

Nova Scotia-

This disease appeared to be more or less general in distribution, but did not cause much immediate damage.

Prince Edward Island-

This disease was general, averaging 17%.

Ontario-

This disease is epiphytotic in the Niagara fruit district. The following table shows the average percentage of the stand affected in the various townships. The Herbert seems to be "commercially resistant" except when planted in close proximity to Cuthbert or Marlboro.

District	Variety	%Mosaic	% Healthy
Grantham	Cuthbert	20	70
	Herbert	6	93
Louth	Cuthbert	20	74
	Marlboro	40	60
Clinton	Cuthbert	28	62
Grimsby	Cuthbert	27	60
	Herbert	1	93
Saltfleet	Cuthbert	18	73
	Herbert	1	98
Burlington	Cuthbert	20	70
	Marlboro	40	55
	Herbert	1	98
Oakville	Cuthbert	9	80
	Marlboro	20	77
	Herbert	0	99

The following notes on the presence of raspberry mosaic in different sections of Ontario show at least that this disease is found generally wherever raspberries are grown. It is not an important disease, however, in Norfolk, Middlesex and Frontenac Counties where representative plantations were seen. The reports from other sections are merely notes and no careful survey has been made.

'ant County, (near Brantford).

One plantation of Cuthbert, 2% mosaic.

Plantation of Herbert, no mosaic.

orfolk County, (near Waterford).

Six large Cuthbert plantings, no mosaic in five and 1% in one.

One Herbert planting, no mosaic.

orfolk County, (near Simcoe).

Small plantation, Cuthbert, 3% mosaic.

Middlesex County (near London).

Three large Marlboro plantings, no mosaic in two and 1% in one.

One Cuthbert planting, 2% mosaic.

Kent County (near Blenheim).

One plantation, Cuthbert, 5% mosaic.

Frontenac County (near Kingston).

One plantation, Columbia, 3% mosaic.

One plantation, Herbert, no mosaic.

One plantation, Cuthbert, 0.5% mosaic.

lgoma District (near Sault Ste Marie).

One plantation, 60 - 70% mosaic.

Thunder Bay District (near Dorion, Murillo and Fort William).

Three plantations, mosaic present.

Cane blight, caused by Leptosphaeria Coniothyrium

ntario-

Severe on variety Herbert in many places in Lincoln County.

Anthracnose, caused by Gloeosporium venetum

Ontario-

Common on the variety Herbert in the Niagara district and doing some damage.

Crown gall, caused by Bacterium tumefaciens

ritish Columbia-

An excrescence on the canes of red raspberries similar to that commonly found on the Snider blackberry and the loganberry have been noticed during the past year at a number of points in the Fraser Valley. The organism has not been isolated from these excrescences but they would seem to be of the nature of Crown Gall.

Leaf rust, caused by Phragmidium imitans.

ritish Columbia-

This disease which caused some alarm on red raspberries in the Fraser Valley two years ago was quite negligible this season. It does not seem likely to prove of economic importance.

STRAWBERRY

Powdery mildew, caused by Sphaerotheca Humuli.

ntario-

Strawberry mildew was important in certain localities in the Niagara fruit district causing some loss. Early application of sulphur dust seems to be very effective in limiting the spread of mildew.

Leaf scorch, caused by Mollisia earliana.

ntario-

This leaf and petiole spot caused considerable losses in southern Ontario. Many plantings were severely damaged. The variety of Glen Mary seems to be very susceptible and most of the loss in the eastern part of the Niagara fruit district was in this variety. Petiole lesions early in the season were the main source of damage as well as abundant blade lesions.

Black root, caused by late freezing injury.

ntario-

Black root was very common in southern Ontario. This trouble is due to the killing of the roots by late freezes. The damage caused by this trouble was confused with the Mollisia leaf scorch injury by the grower and called "blight". A heavy loss in crop resulted in some localities, although on the whole there was a good crop.

Leaf spot, caused by Mycosphaerella Fragariae.

ova Scotia-

Leaf spot was not general in Nova Scotia this year. The disease was observed in a number of plantations, but only slight injury was effected.

rince Edward Island-

Present in all strawberry patches examined, though to a comparatively slight extent.

ntario-

Common in Niagara district but did no damage so far as observed.

anitoba-

Present but not serious.

VEGETABLE DISEASES

BEAN

Blight, caused by Pseudomonas phaseoli

nitoba-

Caused a small amount of damage. The dry weather and prevented optimum growth in the western, southern parts of the province, but the crop was exceptionally good.

skatchewan and Alberta-

This disease was very severe and widespread causing heavy losses in some districts.

Anthracnose, caused by Colletotrichum Lindemuthianum

ince Edward Island-

This disease was entirely held in check by the dry weather. Only a very few lesions were observed throughout the season.

skatchewan and Alberta-

Severe at Rosthern. No other collections were made.

Mosaic, infectious but cause unknown.

ince Edward Island-

Five moderate cases of this diseasewere observed. Infection averaged 1.5%.

RHUBARB

skatchewan and Alberta-

A disease of rhubarb, probably bacterial, was quite destructive at Indian Head, Rosthern and Scott.

PEA.

Powdery mildew, caused by Erysiphe polygoni.

katchewan and Alberta.

Severe in garden peas in some localities in Sask-atchewan and Alberta.

Blight, caused by Ascochyta pisi.

katchewan and Alberta-

Present but not severe.

PEPPERS

itoba-

An alternaria rot of pepper fruits occurred again this year.

POTATO.

The following data on potato diseases is drawn exclusively from the records of the field inspections made by the Division of Botany, Ottawa, in the course of the seed certification survey.

In each field (small or large) the percentage of blackleg, curly dwarf, leaf roll, mosaic, wilts, and misses are computed by actual counts, usually of 100 hills selected in each of three places in the field. Averages by counties (except for the western provinces) were obtained by adding the individual field percentages and dividing by the number of inspections made. No reference was paid to variety, date of inspection, size of plot, etc.

Where two inspections were made of the same field, the figures for both were included as if they were two separate fields. In this way many of the better fields which were granted a second inspection have a double rating, but the average is just as fair as those from first inspections only which were spread over a period of two months. Averages for provinces were obtained by totalling the individual field percentages for the province and dividing by the number of fields inspected. These averages were made in exactly the same way as those for counties. Averages for early blight, late blight, Rhizoctonia and tip burn are shown by citing the percentage of the total number of fields inspected in which each was absent, slight, moderate or severe for each province. No entry was interpreted as meaning absent. In most of the cases of fields inspected the grower had requested the service, anticipating that his field would pass for certification. In Ontario, however, a large number of fields entered in the provincial field crops competition were inspected by arrangement and the figures are included in the averages. In the case of Ontario, therefore, the averages represent a mixture of fields thought to be good enough to pass for certification and those ...

entered in competiitons, more for high yield than any other factor. In the western provinces many fields were suggested for inspection by persons asked for such lists. The service being new in these provinces, the averages represent more nearly the average crop than do the figures for the eastern provinces. Wilts include all wilting diseases except those specified. Tip burn includes hopper burn. Misses include many cases of rhizoctonia.

GENERAL SUMMARY

	No. inspection.	No. acres	Blackleg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhizoctonia	Tip Burn
Nova Scotia	162	303	0.08	0.0	1.82	0.67	0.2	2.62	0-Sl	0	0-Sl	0
Prince Edward Island	436	1484	0.58	0.0	0.06	2.2	1.1	4.7	0-Sl	0	0-Sl	0
New Brunswick	302	1164	0.66	0.0	1.04	3.87	0.04	4.1	0-M	0-Sl	0-M	0
Quebec	1195	3986	0.72	0.06	0.96	3.48	0.25	4.67	0-Sl	0-Sl	0-Sv	0-Sl
Ontario (E)	66	96	0.005	0.01	2.51	1.91	0.00	4.89	0-Sl	0	0-M	0-M
Ontario (W & S)	203	520	0.12	0.006	0.90	2.50	0.05	7.53	0-M	0	0-M	0-Sv
Ontario (N)	603	703	0.35	0.01	0.48	3.52	0.12	4.52	0-M	0	0-Sv	0-Sv
Manitoba	716	1034	0.37	0.03	1.7	0.7	0.9	2.8	0-Sl	0	Sl-Sv	0-Sv
Saskatchewan	114	621	1.5	0.23	0.8	2.6	0.2	2.7	0-Sl	0	Sl-Sv	0-M
Alberta	90	178	0.74	0.04	0.1	1.8	0.35	0.44	0-Sl	0	Sl-Sv	0
British Columbia	41	133	0.8	0.1	3.5	1.2	0.24	0.0	0	0	Sl-M	0

GENERAL SUMMARY

	Early Blight				Late Blight				Rhizoctonia				Tip Burn			
	Abs.	Sl.	Mod.	Sv.	Abs.	Sl.	Mod.	Sv.	Abs.	Sl.	Mod.	Sv.	Abs.	Sl.	Mod.	Sv.
Nova Scotia	83.2	10.6	6.2	0.0	99.4	0.6	0.0	0.0	70.2	27.9	1.9	0.0	96.9	0.6	0.6	1.9
Prince Edward	73.6	25.2	0.7	0.4	100.	0.0	0.0	0.0	76.4	23.1	0.0	0.4	100.	0.0	0.0	0.0
New Brunswick	54.3	31.5	12.6	1.6	78.1	9.9	2.0	0.0	30.5	47.3	21.2	1.0	99.4	0.6	0.0	0.0
Quebec	78.4	15.9	4.8	0.9	94.4	4.9	0.6	0.1	51.7	29.0	12.9	6.4	86.9	11.0	2.1	0.0
Ontario	52.6	38.4	7.2	1.7	98.7	0.9	0.1	0.2	29.9	43.0	21.8	5.2	44.2	33.4	13.5	8.8
Manitoba	68.6	29.6	1.8	0.0	99.9	0.1	0.0	0.0	5.4	56.4	27.1	11.1	70.5	20.7	3.9	4.9
Saskatchewan	89.4	7.0	3.5	0.0	100.	0.0	0.0	0.0	0.0	29.8	37.7	32.5	65.7	26.3	7.9	0.0
Alberta	82.2	17.8	0.0	0.0	100.	0.0	0.0	0.0	2.2	35.5	45.7	16.7	95.6	3.3	1.1	0.0
British Columbia	100.	0.0	0.0	0.0	100.	0.0	0.0	0.0	8.6	37.1	54.3	0.0	100.	0.0	0.0	0.0

Figures refer to the percentage of the total number of fields inspected in which the four diseases, early blight, late blight, Rhizoctonia and tip burn were rated as absent, slight, moderate or severe.

SUMMARY OF TUBER DISEASE REPORTS

Percentage affected.

Prov.	No. Insp.	Bact. rot	Late blight	Net necrosis	Internal spotting	Common Scab	Rhizoctonia	Scurf
N.S.	71	0.07	0.11	0.0	0.0	2.7	1.7	0.0
P.E.I.	125	0.58	0.0	0.0	0.0	8.7	0.5	4.1
N.B.	22	0.16	1.0	0.5	0.4	3.8	1.3	0.07
Que.	197	0.08	0.2	0.24	0.07	0,4	0.3	0.0
Ont.	93	0.37	0.0	0.4	0.4	12.1	6.6	0.0
Man.	58	0.10	0.0	1.0	0.08	4.4	8.2	0.0
Sask.	16	0.06	0.0	1.5	0.06	10.7	2.7	0.0
Alta.	5	0.0	0.0	0.4	0.2	9.0	2.0	0.0

Powdery Scab

P.E.I. Seven cases, average of 4.0%.

N.B. Four cases, aver. of 3.8%.

Ont. Five cases, aver. of 0.5%.

NOVA SCOTIA

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Burn
Annapplis	2	1	0.0	0.0	1.5	1.5	0.15	0.0	0-S1	0	0-S1	0
Colchester	74	122	0.09	0.0	1.1	0.004	0.0	5.6	0-M	0	0-S1	0
Cumberland	1	?	0.3	0.0	0.0	0.0	7.0	4.0	0	0	S1	0
Hants	12	17	0.03	0.0	5.7	0.0	1.3	6.4	0	0	0	0
Kings	49	137	0.03	0.0	2.8	0.02	1.5	3.7	0	0	0-S1	0-S1
Lunenburg	1	1½	0.0	0.0	0.0	1.3	1.0	0.6	0	0	0	S1
Pictou	22	25	0.16	0.0	3.3	4.7	1.4	7.5	0	0	0-S1	0-S1
Averages	162	303	0.08	0.0	1.82	0.67	0.2	2.62	0-S1	0	0-S1	0

Early blight,- Absent in most, slight to moderate in few.

Late blight,- Absent throughout.

Rhizoctonia,- Absent in most, slight in many, moderate to severe in very few.

Tip burn,- Absent throughout.

PRINCE EDWARD ISLAND

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Burn
Kings	114	284	0.62	0.0	0.04	2.01	0.03	5.8	0-S1	0	0-S1	0
Prince	247	913	0.58	0.0	0.02	2.50	1.8	4.1	0-S1	0	0-S1	0
Queens	75	287	0.52	0.0	0.19	1.9	0.7	4.9	0-S1	0	0-S1	0
Averages	436	1484	0.58	0.0	0.06	2.2	1.1	4.7	0-S1	0	0-S1	0

Early blight, Absent in majority, slight in many, moderate to severe in very few.

Late blight, Absent throughout.

Rhizoctonia, Absent in majority, slight in many, severe in very few.

Tip burn, Absent throughout.

NEW BRUNSWICK

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhizoctonia	Tip Burn
Carleton	63	296	0.9	0.0	3.5	2.8	0.09	6.9	Sl-M	0	Sl-M	0
Gloucester	30	76	0.8	0.0	0.5	10.8	0.2	0.8	0-M	0-Sl	0-Sl	0
Madawaska	6	17	0.05	0.0	0.0	18.7	0.0	0.0	0	0	0	0
Restigouche	62	147	1.1	0.0	0.0	0.2	0.0	7.3	0-Sl	0-M	Sl	0
Victoria	60	425	0.24	0.0	1.07	4.01	0.0	0.0	0	0-M	0-M	0
Westmoreland	59	130	0.6	0.0	2.6	3.6	0.0	4.8	0-M	0	0-M	0
York	22	73	0.1	0.0	0.03	4.03	0.0	3.2	0-M	0-Sl	0-M	0
Averages	302	1164	0.66	0.0	1.04	3.87	0.04	4.1	0-M	0-Sl	0-M	0

Early blight, - Absent in most, slight to moderate in many, severe in very few.

Late blight, - Absent in large majority, slight to moderate in several.

Rhizoctonia, - Absent in many, slight to moderate in most, severe in very few.

Tip burn, - Absent throughout.

QUEBEC

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Burn.
Bagot	4	6	0.0	0.0	0.3	0.3	0.3	1.5	0-M	0	0-M	0
Bellechasse	2	5	0.0	0.0	0.3	0.3	0.0	2.8	0	0	Sl	0
Bonaventure	242	427	0.8	0.0	0.55	4.35	0.03	3.1	0-Sl	0	0-M	0-Sl
Champlain	3	5	0.3	0.0	2.6	9.6	0.0	0.0	0	0	0	0-Sl
Charlevoix	56	249	0.4	0.0	4.6	2.5	0.1	0.15	0	0-Sl	0-Sl	0
Drummond	8	10	0.04	0.0	1.3	1.05	0.04	0.7	0-Sl	0	0-Sl	0-Sl
Gaspe	49	62	0.92	0.0	0.49	1.43	0.09	0.28	0	0-Sl	0-Sv	0
Kamouraska	20	43	0.44	0.0	0.53	0.58	0.34	0.91	0-M	0	0-Sl	0-Sl
Lac St Jean	48	119	0.42	0.01	2.2	6.1	0.24	1.4	0-Sl	0-Sl	0-Sv	0-Sl
Laval	15	26	0.0	0.0	0.51	0.15	1.94	0.37	0-Sl	0	0	0-Sl
Levis	8	19	0.04	0.0	2.5	0.04	0.0	0.0	0	0	0	0-Sl
L'islet	10	22	0.39	0.0	1.2	0.97	0.37	1.6	0-Sl	0-M	0-M	0-Sl
Matane	272	1556	1.3	0.23	1.2	2.8	0.66	6.0	0-Sl	0-Sl	0-Sl	0-Sl
Megantic	18	12	0.06	0.0	0.68	0.07	0.6	3.55	0-Sl	0	0-Sl	0
Montmagny	16	18	0.47	0.0	1.04	2.8	0.5	1.1	0-Sl	0	0-M	0-Sl
Quebec	1	4	0.0	0.0	0.6	1.3	0.0	1.3	Sl	0	0	0
Rimouski	235	893	0.75	0.02	0.55	3.9	0.03	7.5	0-M	0	0-M	0-Sl
Temiscouata	180	495	0.49	0.01	0.41	4.4	0.13	6.7	0-M	0	0-Sv	0-M
Terreborne	3	28	0.0	0.0	0.77	0.2	0.77	0.08	0	0	0-Sl	0
Averages	1193	3986	0.72	0.06	0.96	3.48	0.25	4.67	0-Sl	0-Sl	0-Sv	0-Sl

Early blight, - Absent in most, slight to moderate in few and severe in very few.
Late blight, - Absent in most, slight in few, and moderate to severe in very few.
Rhizoctonia, - Absent in about half, slight in many, moderate to severe in several.
Tip burn, - Absent in most, slight to moderate in several, severe in none.

ONTARIO (Summary)

No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhizoctonia	Tip Burn
872	1319	0.27	0.01	0.73	3.16	0.1	5.03	0.M	0	0-M	0-M

Early blight, - Absent in about half, slight in large number, moderate to severe in several.

Late blight, - Absent throughout, except slight in very few.

Rhizoctonia, - Absent in many, slight in large number, moderate to severe in many.

Tip burn, - Absent in many, slight in large number, moderate to severe in many.

ONTARIO (E)

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip burn
Russell	1	1	0.0	0.0	2.60	0.0	0.0	0.60	0	0	Sl	0
Durham	13	24	0.0	0.0	4.97	3.03	0.0	4.01	0-Sl	0	0-Sv	0-Sl
Ontario	9	35	0.04	0.0	0.92	2.25	0.0	14.25	0-Sl	0	0-M	Sl-M
Hastings	26	20	0.0	0.03	1.60	0.98	0.0	3.70	0-Sl	0	0-M	0-Sl
Carleton	10	10	0.0	0.0	2.01	1.80	0.0	4.20	0	0	0-M	0
Peterboro-	7	6	0.0	0.0	3.90	3.20	0.0	0.60	0	0	0-Sv	0
Averages	66	96	.005	0.01	2.51	1.91	0.0	4.89	0-Sl	0	0-M	0-M

Early blight,- Absent in most, slight in some.

Late blight,- Absent throughout.

Rhizoctonia,- Absent in some, slight in many, moderate in few.

Tip burn,- Absent in some, slight in many, moderate in few.

ONTARIO (W & S)

	No.	Acres	Black-leg.	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Burn
Grey	18	19	0.0	0.0	0.6	4.7	0.0	5.9	0	0	0-M	0-M
Wellington	2	29	0.0	0.0	1.1	1.1	0.0	4.6	0	0,	Sl	Sl
Bruce	29	98	0.0	0.0	1.3	4.0	0.0	7.9	0-Sl	0	0-M	0-M
Simcoe	17	61	0.0	0.0	1.7	6.6	0.0	4.1	0	0	0-Sl	0-M
Elgin	7	11	0.0	0.0	1.8	0.6	0.0	4.3	0-M	0	0-Sl	Sl-Sv
Huron	2	2	0.0	0.0	1.1	0.2	0.0	2.3	Sl	0	Sl	0-M
York	16	38	0.2	0.0	1.5	6.1	0.1	6.2	0-Sl	0	Sl-M	0-M
Halton	13	12	0.0	0,03	0.6	1.0	0.0	10.4	0-M	0-Sl	0-Sv	0-M
Wentworth	19	19	0.0	0.0	0.4	2.2	0.0	11.1	0-M	0	Sl-Sv	0-Sv
Welland	18	22	1.04	0.05	0.7	0.5	0.0	6.4	0-Sl	0	Sl-Sv	0-Sl
Norfolk	33	57	0.0	0.0	0.7	0.2	0.0	8.8	0-Sl	0	0-M	0-M
Brant	1	1	0.0	0.0	1.0	4.0	0.0	1.3	Sl	0	0	M
Middlesex	25	68	0.1	0.0	3.95	5.5	0.36	6.9	0-M	0	0-Sl	0-Sv
Kent	3	83	0.0	0.0	0.66	0.11	0.0	18.2	0-Sl	0	0-M	Sl-M
Averages	203	520	0.12	0.006	0.9	2.5	0.05	7.53	0-M	0	0-M	0-Sv

Early blight, - Absent in most, slight in some, and moderate in few.
Late blight,- Absent throughout (inspections made early).
Rhizoctonia,- Absent in some, slight and moderate in most, severe in few.
Tip burn,- Absent in many, slight and moderate in many, severe in few.

ONTARIO (N)

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Burn
Muskoka	63	34	0.04	0.0	0.44	3.21	0.00	1.30	0	0	Sl	0-S
Parry Sound	138	116	0.06	0.0	1.58	5.98	0.00	4.31	0-M	0	0-M	0-S
Nipissing	23	40	0.04	0.0	0.00	3.25	0.04	7.98	0-Sl	0	0-Sl	0-S
Temiskaming	59	47	1.13	0.0	0.90	6.54	0.32	6.02	0-Sv	0	0-Sv	0-S
Sudbury	15	60	0.71	0.0	0.04	0.95	0.29	5.35	Sl-M	0-Sv	0-M	0-M
Algoma	30	83	0.02	0.0	0.08	1.09	0.00	0.75	0-M	0	0-M	0-S
Thunder Bay	98	200	0.50	0.03	0.11	3.68	0.11	1.15	Sl	0	Sl-M	0-S
Rainy River	48	48	0.22	0.0	0.06	1.54	0.27	3.02	0-Sl	0	0-Sv	Sl-M
Kenora	79	75	0.79	0.03	0.19	1.17	0.32	5.96	0-Sl	0	0-Sv	0-M
Averages	603	703	0.35	0.01	0.48	3.52	0.12	4.52	0-M	0	0-Sv	0-S

Early blight, - Absent or slight in majority, moderate and severe in a few.

Late blight, - Practically absent throughout, except slight to severe in Sudbury.

Rhizoctonia, - Absent in many, slight to moderate in majority and severe in a few.

Tip burn, - Absent in about half, slight in many and moderate or severe in several.

WESTERN PROVINCES

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Burn
Manitoba	716	1034	0.37	0.03	1.7	0.7	0.9	2.8	O-Sl	0	Sl-Sv	O-Sv
Saskatchewan	114	622	1.5	0.23	0.8	2.6	0.2	2.7	O-Sl	0	Sl-Sv	O-M
Alberta	90	178	0.74	0.04	0.1	1.8	0.35	0.44	O-Sl	0	Sl-Sv	O
British Columbia	41	133	0.8	0.1	3.5	1.2	0.24	0.0	0	0	Sl-M	0

Manitoba- Early blight,- Absent in majority, slight to moderate in many.
Late blight,- Absent throughout.
Rhizoctonia,- Absent in very few, slight in majority and moderate to severe in great many.
Tip burn,- Absent in majority, slight in many, moderate to severe in few.

Saskatchewan- Early blight,- Absent in most, slight to moderate in a few.
Late blight,- Absent throughout.
Rhizoctonia,- Absent in none, evenly divided between slight, moderate and severe.
Tip burn,- Absent in most, slight in many, moderate in few.

Alberta- Early blight,- Absent throughout.
Late blight,- Absent throughout.
Rhizoctonia,- Slight in many, moderate to severe in majority.
Tip burn,- Absent throughout, except slight in very few.

British Columbia,- Early blight- Absent throughout.
Late blight,- Absent throughout.
Rhizoctonia,- Slight in many, moderate in majority.
Tip burn,- Absent throughout.

NOTES ON POTATO DISEASES.

Late blight, caused by Phytophthora infestans.

rario-

Found in a few fields in Frontenac County, not prevalent.

itoba-

Has not been found in Manitoba.

katchewan and Alberta-

Not reported in Saskatchewan or Alberta. The writer has never observed this disease in the prairie provinces of western Canada.

ish Columbia-

The only areas where this disease occurred were the Chilliwack Valley and the Delta. In the former area in one case tuber infection to the extent of 50% occurred but more commonly it was from 5% to 20%.

Early blight, caused by Alternaria solani.

oba-

This disease was quite common in 1921; but appeared late. It hastened somewhat the maturing of the plants.

tchewan and Alberta-

Quite severe in Saskatchewan and Alberta, and caused considerable loss. "Early blight was worse than in the last four years in the Edmonton district." (Sanford).

tish Columbia-

Did a certain amount of damage in the northern sections of Vancouver Island.

Leaf roll, cause unknown.

itoba-

Much rolling of leaves was found in fields in all parts; but especially in the drier South-west; usually it was attributed to the hot, dry conditions. Throughout the Province, true leaf roll was present in many fields; but seldom to an extent of more than two or three percent.

katchewan and Alberta-

In Alberta leaf roll was reported as scarce.

tish Columbia-

Leaf roll occurs but is not usually noticeable. Small plots have been found showing over 25% but the highest record obtained during certified seed inspection was about 6½% (Netted Gem at Sooke V.I.).

Mosaic, cause unknown.

itoba-

Like leaf roll, generally distributed; but usually in small percentages. In a few fields, a rather large percentage of plants showed decided symptoms. In other fields, especially of such varieties as Wee MacGregor, the foliage almost uniformly suggested mosaic; but no well-marked examples occurred.

katchewan and Alberta-

This disease was reported as rather severe in many places in Alberta by Holmes. Other reports from Edmonton and Lacombe state that it was not very common, Mr.Greaney reports about 9% in some fields in Saskatchewan.

tish Columbia-

Rather widely distributed but rarely more than 2% in fields grown for certified seed. In other cases as high as 50% or more has been observed.

Rhizoctonia, caused by Corticium vagum-solani.

itoba-

Rhizoctonia was very prevalent. It is responsible for many misses, and black scurf is exceedingly common on potatoes in the Red River Valley. Rhizoctonia is one of the most trouble-some potato diseases. Found as lesions on the stems in practically all crops, on a large percentage of the plants usually. New and old land, treated (formalin) and untreated seed, and all localities were affected, seemingly without much advantage in favor of one over another. Comparatively few crops seemed to have suffered much from its presence, either in stand or as indicated by symptoms on the growing plant. "Little potatoes" above ground were abundant on one crop, in a very wet portion of the

field only. The occurrence of the sclerotia on the harvested tubers varied from practically none to well over 75 percent of the tubers; but it is my opinion that absence of sclerotia coincided generally with immaturity when dug or killed by frost.

atchewan and Alberta-

Rhizoctonia was as usual very severe. This is the most serious disease of potatoes in Western Canada, and causes much reduction in yield.

Blackleg, caused by Bacillus Phytophthorus.

oba-

Irregularly present, and usually only in small percentage. Wetter parts of fields were found worse affected in one or two localities. Not serious.

tchewan and Alberta-

This bacterial disease was present, but not severe in Saskatchewan. Mr. Greaney reported about 2% in the fields inspected. In the Edmonton district this disease was much more severe.

Wilt, caused by Fusarium.

oba-

Common but the losses were not large. Typical wilting was rather uncommonly noticed except by one inspector, although a slight browning of the vascular layer of the stems, without wilting of the tops, was not infrequent. In some fields, an unthrifty appearance of the upper part of the plant, due to rolling, and a purplish cast of the foliage was noticed on numbers of plants.

skatchewan and Alberta-

There were no reports on Fusarium wilt. It occurs, but is not common.

tish Columbia-

Generally distributed and affecting 1% to 5% of the plants, occasionally more.

Tip burn.

toba-

This was quite abundant late in the season. Leaf hoppers evidently induced most of this trouble and became quite abundant.

Scab, caused by Actinomyces chromogenus.

toba-

Found especially abundant this year. Presence quite variable. Perhaps somewhat more frequently serious on the lighter soils and on the Cobbler variety. A deep or pitted type was plentiful in one crop grown from Minnesota seed; while the adjoining crop from local seed of the same variety, Cobbler, was free. In another locality, a few specimens of what may have been Oospora pustulans were found.

atchewan and Alberta-

As usual very common.

Minor diseases of potatoes.

Powdery scab (Spongospora subterranea). "Powdery scab existed at least three years on two plots in Edmonton, Alta., badly scabbing the potatoes.

It has not spread to my knowledge." (Sanford). This is the only report of Powdery scab.

Powdery scab in British Columbia is practically confined to the Lower Fraser Valley and rarely more than 2% of the tubers are affected.

Curly dwarf (cause unknown). Occasionally found in Manitoba.

Armillaria mellea(?)...In acrop grown on new land in northern Manitoba, several tubers were found bearing strands similar to those illustrated in Bisby and Tolaas' bulletin, Potato Diseases in Minnesota.

Dry Rot (caused by Fusarium discolor sulphureum and other Fusaria) developed during storage last winter in Manitoba, and caused probably, a considerable loss of stored potatoes.

Net necrosis, etc. A variety of internal netting browning etc. in the vascular layer of the stem end and usually reaching very slightly away from the stem attachment are found in Manitoba. In only one crop was netting very pronounced and general. In some Early Ohios, the tendency to red streaking and blotching in the flesh is strong.

"Bronzing." Under this term may be reported a trouble which occurred on several farms in the Dauphin district of Manitoba, mostly on long-cropped rather light soils; but in one case a newly-broken, almost peaty, soil in

a slight hollow. Where worst, the yield was seriously reduced on all but certain clearly-marked areas scattered through the fields, probably representing burned straw piles, where the vines remained green. The main crop first became bronzed or purplish and later brown and reduced in size and died prematurely. The suggestion is offered that the trouble is a form of "potash hunger." A full report on its occurrence, the symptoms and the cultural and other conditions was made, and samples of the soil were submitted to the Division of Botany, Ottawa.

Arsenical injury. Occasional in Manitoba. In one field where some plants were actually girdled at the surface of the ground and many others less severely injured; the Paris Green could be recognized by its color in the soil.

TOMATO-

Blossom end rot caused by fluctuating water supply.

Manitoba-

This disease was very common again this year and is the worst tomato disease. Other diseases of tomato seemed practically absent.

Saskatchewan and Alberta-

Present in a few gardens in Saskatchewan.

Buck-eye rot, caused by Phytophthora terrestria.

British Columbia-

This disease was found to be causing a slight amount of loss in a green-house at Victoria.

Mosaic, infectious but cause undetermined.

Prince Edward Island-

This trouble was found to a moderate extent. Average occurrence about 3.5%.

Ontario-

Common in the Niagara peninsula.

TURNIP

Club root, caused by Plasmodiophora brassicae

Nova Scotia-

Numerous cases reported, infection varying from 1 to 7%. In one case in King's County, however, 45% of the crop was affected.

Prince Edward Island-

This disease was observed in slight to moderate amounts in different parts of the province.
